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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/732,966	12/10/2003	Hung Chih Chen	8402/CPS/22558-0021001	9309
26185	7590	04/01/2011		
FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER MACARTHUR, SYLVIA	
			ART UNIT	PAPER NUMBER
			1716	
			NOTIFICATION DATE	DELIVERY MODE
			04/01/2011	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HUNG CHIH CHEN and
STEVEN M. ZUNIGA

Appeal 2010-001833
Application 10/732,966
Technology Center 1700

Before BRADLEY R. GARRIS, ADRIENE LEPIANE HANLON, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's refusal to allow claims 1 through 5, 7 through 9, 11, and 13 through 22. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

The subject matter on appeal is directed to, *inter alia*, a retaining ring. Claim 1 is illustrative:

1. A retaining ring comprising:

a generally annular body having a top surface, a bottom surface, an inner diameter surface, and an outer diameter surface, wherein the bottom surface includes a plurality of channels, each channel extending from the inner diameter surface to the outer diameter surface and having a curved section defining a rounded ceiling and substantially vertical side walls, wherein the curved section extends from the inner diameter to the outer diameter and the ceiling is concave in a cross-section perpendicular to the side-walls, a distance between the side-walls is constant from the bottom surface to the curved section and the outer diameter surface includes a ledge and a height of at least one of the vertical side-walls is substantially the same as a height of the ledge.

The Examiner maintains the following rejections:

1) claims 1-5, 7, 8, 13, and 18-22 under 35 U.S.C. § 103(a) over Chen (US 2005/0113002 A1, published May 26, 2005) and Hosoki (US 6,280,306 B1, issued Aug. 28, 2001);

2) claims 1-3, 7, 8, 11, 18-20, and 22 under 35 U.S.C. § 103(a) over Glashauser (US 6,419,567 B1, issued Jul. 16, 2002) and Hosoki;

3) claim 9 under 35 U.S.C. § 103(a) over Chen in view of Hosoki or Glashauser in view of Hosoki; and

4) claims 11 and 14-17 under 35 U.S.C. § 103(a) over Glashauser or Chen in view of Hosoki and further in view of DeMeyer (US 2003/0070757 A1, published Apr. 17, 2003).

With respect to rejection (1), Appellants focus their arguments on independent claims 1, 19, and 20. (App. Br. 3-6 and Reply Br. 1-2). Accordingly, we address Appellants' arguments with respect to these claims only. *See* 37 C.F.R. § 41.37(c)(1)(vii).

With respect to rejection (3) based on Chen and Hosoki and rejection (4) based on Chen, Hosoki, and DeMeyer, Appellants provide no additional arguments for these rejections and instead refer to the arguments made regarding the rejection of claim 1 in rejection (1). (App. Br. 6 and 7). Therefore, the claims rejected in rejection (3) based on Chen and Hosoki and in rejection (4) based on Chen, Hosoki, and DeMeyer stand or fall with our decision regarding claim 1 in rejection (1).

Rejections (1), (3), and (4): Rejections Based on Chen

ISSUE

Did the Examiner reversibly err in determining that the combined teachings of Chen and Hosoki would have suggested a retaining ring, a carrier head, and a method of polishing having the “outer diameter surface [of the retaining ring that] includes a ledge” feature and the “height of at least one of the [channel’s] vertical side-walls is substantially the same as a height of the ledge” feature required by claims 1, 19, and 20 within the meaning of § 103(a)? We decide this issue in the negative.

FINDINGS OF FACT (FF)

1. The Specification does not disclose the function of ledge 140, which may be located at the lower portion of the retaining ring's outer surface 116. (*See Spec.* in its entirety).
2. The Specification does not explain why the “height of at least one of the [channel's] vertical side-walls is substantially the same as a height of the ledge” feature required by the claims is critical. (*See Spec.* in its entirety).
3. Hosoki's Figure 5 illustrates a retaining ring 27 having a step portion 27a located near the upper portion of the retaining ring's outer surface. Hosoki's Figure 5 illustrates that step portion 27a provides a mating engagement with the ledge portion 30 of the wafer holding head's peripheral wall 24. (*See also* Hosoki, col. 9, ll. 14-23 and col. 10, ll. 29-39).

ANALYSIS AND CONCLUSION

We begin by noting that each of claims 1, 19, and 20 recites that “the outer diameter surface [of the retaining ring] includes a ledge.” Thus, this claim limitation based on its plain meaning does not restrict the position of the ledge to any particular location on the retaining ring's outer diameter surface. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (stating that “the claims themselves provide substantial guidance as to the meaning of particular claim terms.”). Accordingly, we construe the claim as encompassing a ledge positioned anywhere on the retaining ring's outer diameter surface including the upper or lower portion of the retaining ring's outer diameter surface.

This interpretation is consistent with Appellants' Specification since it discloses that a ledge may be on the upper surface 128 of the retaining ring (e.g., the upper portion of the retaining ring's outer surface 116 that connects to the upper surface 128). (Spec. 6, ll. 20-21). In addition, Appellants' Figures 1 and 3 illustrate a ledge 140 located at the lower portion of the retaining ring's outer surface 116.

Turning our attention to the rejection, Appellants argue that the Examiner's reason for combining Chen and Hosoki is improper because (1) "[t]here is no evidence or articulated reason" to support the Examiner's reason for combining the references (App. Br. 4); and (2) that the Examiner's stated reason for combining the references would "lead away" from the invention since "[i]f the goal were to decrease a change in downward pressure [as stated by the Examiner] . . . the channel height should be reduced rather than made equal to the height of the ledge." (App. Br. 4 and 5).

Appellants also argue that the Examiner has not provided an adequate reason to "adjust the height of Chen's channels or Hosoki's step portion to be substantially the same." (App. Br. 4). Appellants argue that "optimization would not . . . [have led] a person having ordinary skill in the art to set the heights equal." (App. Br. 5). Appellants also argue that "[t]he Examiner has not shown that the height of the channel is a result-effective variable." (*Id.*).

It appears that Appellants misunderstand the Examiner's rationale for arriving at the claimed inventions. In this regard, the Examiner finds, and Appellants do not specifically dispute, that Chen teaches the claimed invention except for the "outer diameter surface [of the retaining ring]

includes a ledge” feature and the “height of at least one of the [channel’s] vertical side-walls is substantially the same as a height of the ledge” feature required by claims 1, 19, and 20. (*Compare* Ans. 3-5¹ with App. Br. 3-6 and Reply Br. 1 and 2).

While Chen does not explicitly teach a ledge as required by the claims, the Examiner relies on Hosoki to show that ledges were known in the art to provide mating engagement and stability.

In this regard, Hosoki teaches a retaining ring 27 having a step portion 27a (corresponding to the ledge feature), which is located at the upper portion of the retaining ring’s outer diameter, that provides a mating engagement with the ledge portion 30 of the wafer holding head’s peripheral wall 24. (FF 3). It is apparent from Hosoki that this mating engagement provides a stable connection between Hosoki’s retaining ring and its wafer holding head’s peripheral wall.

Thus, we agree with the Examiner that it would have been obvious to one of ordinary skill in the art to employ a known ledge, such as Hosoki’s step portion (corresponding to the ledge feature) positioned at the upper portion of Chen’s retaining ring’s outer peripheral surface as taught by Hosoki in order to provide mating engagement and stability. Indeed, in reference to our above claim construction, the claim encompasses a ledge positioned anywhere on the retaining ring’s outer diameter surface including the upper portion of the retaining ring’s outer diameter surface.

¹ Since the Answer numbers two of its pages as “Page 2” and another two of its pages as “Page 3,” we *renumber*, consecutively, all of the pages of the Answer starting with 1 at the page entitled “EXAMINER’S ANSWER.”

In addition, it would have been within the skill level of one of ordinary skill in the art to determine the optimum height of the ledge, including the height required by claim 1, based on the degree of stability sought. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (stating that “[A]nalysis [of whether the subject matter of a claim would have been obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”).

The Specification does not disclose why the “height of at least one of the [channel’s] vertical side-walls is substantially the same as a height of the ledge” feature required by the claims is important. (*See* FF 2). This further underscores the obviousness of the claimed height of the ledge.

Accordingly, Appellants’ arguments are without persuasive merit.

Thus, we sustain the Examiner’s rejection (1), rejection (3) based on Chen and Hosoki, and rejection (4) based on Chen, Hosoki, and DeMeyer.

Rejections (2) and (3): Rejections based on Glashauser and Hosoki

With respect to rejection (2), Appellants argue that “Glashauser describes a retaining ring with a partially open chamber 350 However, the partially open chamber of Glashauser does not extend ‘from the inner diameter surface to the outer diameter’ as recited in [the] independent claims.” (App. Br. 6). We agree.

While the Examiner alleges (Ans. 4) that “Glashauser teaches . . . a plurality of channels (grooves 350), see Fig. 8F[,] Each channel extends from the inner diameter surface to the outer diameter surface See depictions of carrier heads in Fig. Fig. 1A,” the portions of Glashauser relied

upon by the Examiner fail to teach “each channel extending from the inner diameter surface to the outer diameter surface” as required by claims 1, 19, and 20.

Indeed, Glashauser’s Figure 1A and Figure 5 plainly illustrate a chamber 350 (corresponding to the claimed channel as alleged by the Examiner) extending from the retaining ring’s inner surface 301 (corresponding to the claimed inner diameter surface feature as alleged by the Examiner) to the retaining ring’s annular body 352 and not to the retaining ring’s outer diameter surface as required by the claims. (*See* Glashauser, col. 4, ll. 40-45).

With respect to rejection (3) based on Glashauser and Hosoki, the Examiner relies on the same factual findings and determinations discussed above to meet the disputed claim features of independent claims 1, 19, and 20.

Accordingly, for the reasons stated by Appellants in the Briefs and as discussed above, we reverse the Examiner’s rejection (2) and rejection (3) based on Glashauser and Hosoki.

Rejection (4) based on Glashauser, Hosoki, and DeMeyer

The Examiner relies on the same factual findings and determinations discussed above to meet the disputed claim features of independent claims 1, 19, and 20 and does not provide any additional findings or determinations as to how DeMeyer would have satisfied the disputed claim feature.

Therefore, for the reasons stated above, we reverse the Examiner’s rejection (4) based on Glashauser, Hosoki, and DeMeyer.

Accordingly, for the reasons stated by Appellants in the Briefs and, as discussed above, we reverse the Examiner's rejection (4) based on Glashauser, Hosoki, and DeMeyer.

DECISION

In summary, we affirm the Examiner's rejection (1), rejection (3) based on Chen and Hosoki and rejection (4) based on Chen, Hosoki, and DeMeyer and reverse the Examiner's rejection (2), rejection (3) based on Glashauser and Hosoki, and rejection (4) based on Glashauser, Hosoki, and DeMeyer.

TIME PERIOD

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED

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